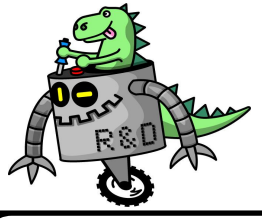
Arduino Cheat Sheet V.02c

Mostly taken from the extended reference:
http://arduino.cc/en/Reference/Extended
Gavin Smith – Robots and Dinosaurs, The Sydney Hackspace



Structure

void **setup**() void **loop**()

Control Structures

```
if (x<5){ } else { }
switch (myvar) {
  case 1:
    break;
  case 2:
    break;
  default:
}
for (int i=0; i <= 255; i++){ }
while (x<5){ }
do { } while (x<5);
continue; //Go to next in do/for/while loop
return x; // Or 'return;' for voids.
goto      // considered harmful :-)
```

Further Syntax

// (single line comment)
/* (multi-line comment) */
#**define** DOZEN 12 //Not baker's!
#**include** <avr/pgmspace.h>

General Operators

= (assignment operator)
+ (addition) - (subtraction)
* (multiplication) / (division)
% (modulo)
== (equal to) != (not equal to)
< (less than) > (greater than)
<= (less than or equal to)
>= (greater than or equal to)
&& (and) || (or) ! (not)

Pointer Access

& reference operator
* dereference operator

Bitwise Operators

& (bitwise and) | (bitwise or)
^ (bitwise xor) ~ (bitwise not)
<< (bitshift left) >> (bitshift right)

Compound Operators

++ (increment) -- (decrement)
+= (compound addition)
-= (compound subtraction)
*= (compound multiplication)
/= (compound division)
&= (compound bitwise and)
|= (compound bitwise or)

Constants

HIGH | LOW
INPUT | OUTPUT
true | false
143 // **Decimal** number
0173 // **Octal** number
0b11011111 //**Binary**
0x7B // **Hex** number
7**U** // Force unsigned
10**L** // Force long
15**UL** // Force long unsigned
10.0 // Forces floating point
2.4e5 // 240000

Data Types

void
boolean (0, 1, false, true)
char (e.g. 'a' -128 to 127)
unsigned char (0 to 255)
byte (0 to 255)
int (-32,768 to 32,767)
unsigned int (0 to 65535)
word (0 to 65535)
long (-2,147,483,648 to 2,147,483,647)
unsigned long (0 to 4,294,967,295)
float (-3.4028235E+38 to 3.4028235E+38)
double (currently same as float)
sizeof(myint) // returns 2 bytes

Strings

```
char S1[15];
char S2[8]={'a','r','d','u','i','n','o'};
char S3[8]={'a','r','d','u','i','n','o','\0'};
  //Included \0 null termination
char S4[ ] = "arduino";
char S5[8] = "arduino";
char S6[15] = "arduino";
```

Arrays

```
int myInts[6];
int myPins[] = {2, 4, 8, 3, 6};
int mySensVals[6] = {2, 4, -8, 3, 2};
```

Conversion

char() **byte**()
int() **word**()
long() **float**()

Qualifiers

static // persists between calls
volatile // use RAM (nice for ISR)
const // make read-only
PROGMEM // use flash

Digital I/O

pinMode(pin, [INPUT,OUTPUT])
digitalWrite(pin, value)
int **digitalRead**(pin)
//Write High to inputs to use pull-up res

Analog I/O

analogReference([DEFAULT,INTERNAL,EXTERNAL])
int **analogRead**(pin) //Call twice if switching pins from high Z source.
analogWrite(pin, value) // PWM

Advanced I/O

tone(pin, freqhz)
tone(pin, freqhz ,duration_ms)
noTone(pin)
shiftOut(dataPin, clockPin, [MSBFIRST,LSBFIRST], value)
unsigned long **pulseIn**(pin, [HIGH,LOW])

Time

unsigned long **millis**() // 50 days overflow.
unsigned long **micros**() // 70 min overflow
delay(ms)
delayMicroseconds(us)

Math

min(x, y) **max**(x, y) **abs**(x)
constrain(x, minval, maxval)
map(val, fromL, fromH, toL, toH)
pow(base, exponent) **sqrt**(x)
sin(rad) **cos**(rad) **tan**(rad)

Random Numbers

randomSeed(seed) // Long or int
long **random**(max)
long **random**(min, max)

Bits and Bytes

lowByte() **highByte**()
bitRead(x,bitn) **bitWrite**(x,bitn,bit)
bitSet(x,bitn) **bitClear**(x,bitn)
bit(bitn) //bitn: 0-LSB 7-MSB

External Interrupts

attachInterrupt(interrupt, function, [LOW,CHANGE,RISING,FALLING])
detachInterrupt(interrupt)
interrupts()
noInterrupts()

Libraries:

Serial.
begin([300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200])
end()
int **available**()
int **read**()
flush()
print()
println()
write()

EEPROM (#include <EEPROM.h>)
byte **read**(intAddr)
write(intAddr,myByte)

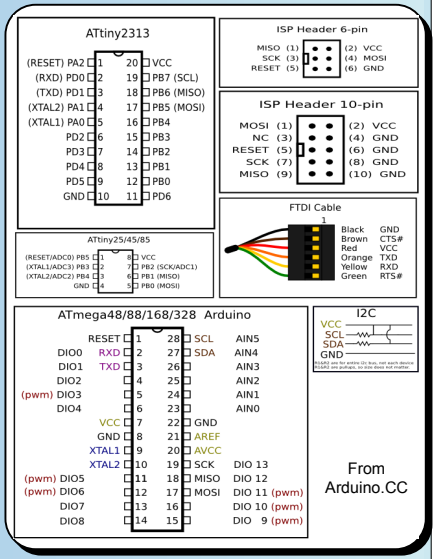
Servo (#include <Servo.h>)
attach(pin , [min_uS, max_uS])
write(angle) // 0-180
writeMicroseconds(uS) //1000-2000, 1500 is midpoint
read() // 0-180
attached() //Returns boolean
detach()

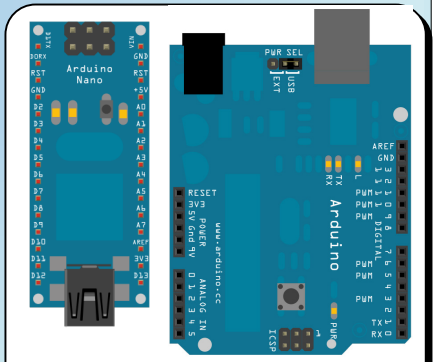
SoftwareSerial(RxPin,TxPin)
// #include<**SoftwareSerial**.h>
begin(longSpeed) // up to 9600
char **read**() // blocks till data
print(myData) or **println**(myData)

Wire (#include <Wire.h>) // For **I2C**
begin() // Join as master
begin(addr) // Join as slave @ addr
requestFrom(address, count)
beginTransmission(addr) // Step 1
send(mybyte) // Step 2
send(char * mystring)
send(byte * data, size)
endTransmission() // Step 3
byte **available**() // Num of bytes
byte **receive**() //Return next byte
onReceive(handler)
onRequest(handler)

	ATMega168	ATMega328	ATmega1280
Flash (2k for boobtloader)	16kB	32kB	128kB
SRAM	1kB	2kB	8kB
EEPROM	512B	1kB	4kB

	Duemilanove/ Nano/ Pro/ ProMini	Mega
# of IO	14 + 6 analog (Nano has 14+8)	54 + 16 analog
Serial Pins	0 - RX 1 - TX	0 - RX1 1 - TX1 19 - RX2 18 - TX2 17 - RX3 16 - TX3 15 - RX4 14 - TX4
Ext Interrupts	2 - (Int 0) 3 - (Int 1)	2,3,21,20,19,18 (IRQ0- IRQ5)
PWM pins	5,6 - Timer 0 9,10 - Timer 1 3,11 - Timer 2	0-13
SPI	10 - SS 11 - MOSI 12 - MISO 13 - SCK	53 - SS 51 - MOSI 50 - MISO 52 - SCK
I2C	Analog4 - SDA Analog5 - SCK	20 - SDA 21 - SCL





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